Notes on Insecta collected on the Expedition sent out by the Cal Acad Sciences to the Galapagos Ids & way islands. June-28-1905.
By F. X. Williams. 1

<u>Ensendda</u>, Lower California July 2-5-

All collecting done at low altitude. The locality is dry & hilly with larger mts a few miles behind the town better wooded. Up some cañons it is quite brushy & moist along creek beds. The valley is large & flat & just back of the fine beach are sand dunes rather similar to those of S.F. Very warm during our stay at this place.

no. Coleoptera.

1.E On trunk of Sycamore tree in main creek bed one mile back of Ensenada. Sycamores rather scattered.

2" On trunk of Sycamore tree & apparently feeding on a fungus growth thereon.

3" On my person 1 mile back of town

4" In foothills _ Slevin Coll.

5" Back of Ensenada feeding on plants, fairly common

6" In creek bed (damp) under stones & under leaves in a sycamore hollow.

7" Running across road

8" Under stones

9" In great nos. under drying seaweed & feeding on same - on long sandy beach.

10" Feeding on dead crustacea - sandy beach

11" On sand. - sandy beach

12 Running about rapidly feeding on dead crustacea - sandy beach

Ensenada. (Contd)

13-E Caught on the wing
14 E Cast ashore, also nos. 10 = Histerids, 11 = carabids etc + nos 9 under seaweed. Many insects are cast ashore here probably during the night. This does not appear to be the case in any of the Galapagos or way ids.
15" Feeding at flowers of buckwheat fam. on coast cliffs.
16" Back of Ensenada in creek bed on sp of Artemisia on which lived a coccidae.
17" Out at sea Lat 31°12'N Long 116°47'15"W Slevin Coll
18" Gyrinids in pond just back of beach. Hemiptera etc cast ashore.
19" Scorpions under stones + bark, Spiders on webs.

Lepidoptera.

Here we can see that we are getting into the tropics: the Sonoran region. I probably struck the second brood of most lepidoptera.

Danais sp. rather scarce, seen in different places, back in cañons esp. most appeared worn.

Agraulis sp (doubtful of position) several seen flying over sand dunes

Melitaea sp. rare + late, in sand hollows only two or three seen + one taken.

Colias Eurytheme fairly abundant.

# Ensenada (Contd)

Pieris:- common back of town esp.
Coenonympha sp - only two specms seen & taken in a cañon on the left of main valley.
~~Terias~~ Nathalis - rather scarce - in main valley & rather fresh
Lemonias - rather scarce, in main valley on and flats
Lycaena acmon - not common, in sand dunes.
L. exilis, common on food plant
L. sp - (7 specms, resemble Gal. specms) quite common esp back in wooded cañons, several flying together esp around large bush (Rhamnacea)? having (its flowers) a pleasant chocolate like odor.
L. Comyntas sp. fairly common esp in sand-dunes.
Thecla sp. fairly abundant flying singly around bush.
Pamphila rare, in barren spots in sand dunes, creek bed etc.
Big Sulphurs - rare & fresh flying fast back of town, do not alight but have a strong flight in dry creek bed. back of town.
Eudamus - rare - back of town in dry creek bed always alighting back of Sycamore tree after circumventing the place. very swift. Thanaos rather rare.
Syneda 1 sp seen & taken in creek bed

1655. 1125.

Ensenada. (contd)

Notodontid on Sycamore. Sphinx July 8th on vessel 15± miles from Ensenada.

Lepidoptera Seen

Pyrameis cardui & caryae fairly common. 1 Pap. Eury medon? seen in canon. P. Philenor fairly common. Megamostoma 2 or 3 seen fresh. De lineata - fairly common about sand dunes. several empty chrysalids of same found in dunes. A sesiidae emerged in cabin some time in July. I did not observe it & ∴ it was spoilt. Only 1 good pupa taken, shells very numerous under perforated Sycamore bark back of Town. when offshore saw a few papilios & other large flies

Other Insects.

Several species of grasshoppers very abundant esp back of town in broad ravine. One cricket on beach. Cicadas abundant on Shrubbery. Hymenoptera rare one Bombus one Mutillid. ~~Syrphus~~ Robber flies common, some Bombyliidae. A couple of Tachynids. Pompilids common —.

# San Martin Id.

July 11th

Spent three hours on this barren rookery of birds. Island of low elevation covered in places with small bushes, cacti etc.

1 S.M. SE part of Id, under stones etc. Sea birds' nests low altitude

2 " E part under stones & guano dust. Apparently rather late for nos 1 & 2. Spiders predominated everywhere.

3 " E part on webs.

~~4~~ 4 " Everywhere on webs.

5 " SE shore on western gull body.

6 " Under stones.

# San Geronimo

July 13th

~~1 S.G.~~ Spent two hours collecting there. This Island is more fertile & sandy on W coast. little sand dunes.

1 S.G. W coast mostly under plants in sand, a few under stones. Those under plants in sand of same habitat as those of S.F. Cal.

2 " W Coast under dead lesser auk.

3 " Mostly on highest part & center of island where there was but ~~little~~ soil. Found in small colonies under flat stones & in chinks of the same. Beetles not active.

4 " W coast, on & in sand under plants.

over.

San Geronimo (Continued)

5 SG Lepidopterous larvae under sand as commonoctuid in S.F. Cal. Scorpion, Spider & coleoptera under stones in different parts of the island.

6 " On sand under plant W Coast

7 " W Coast burrowing in sand near beach.

San Martin Lep. = 2 Hymenoptera sp (bee) fairly common on Hydrophyllaceae? Lycaena exilis very common. Thecla martialis rather rare, Pyrameis caryae 1 spcm seen. 1 Sp Pterophoridae, common. Small pupal shells common beneath stones = geometrids

San Geronimo = 3.

1 Spcm megamstoma seen, taken 2 noctuids taken resting under stones. West coast sandy & more fertile, Several noctuid larvae taken under sand as in S.F. (see Coleoptera #5) smaller noctuid W coast. 2 geometrids, common pupal shells of same common under stones in sand etc. Pyrameis Cardui 1 or 2 seen. L Exilis rather common, T martialis rare. —

San Benito. (West. July 14th

Coleoptera etc

The tallest of the three Ids. & very dry. vegetation smaller & of dry sort. Probably the best collecting near the E shore where spiders & tenebrionids were fairly common under stones. Spent four hours collecting here

W.S.B.

" 1 E coast about one hundred feet from sandy beach under stones

" 2 All over the island under stones, esp on lower land

" 3 Mostly congregated under stones, higher altitude.

" 4 E coast under stones, one or two together 1 cerambycid = # 5.

" 5 On agave (lower part) in a cañon, Rhyncophora in its dead stems.

" 6 Scorpions & spiders under stones.

San Benito (Middle & E)

Spent one hour & a half at Middle & eight at E San Benito, Middle SB very low & small very much better collecting on Middle San Benito than on E San Benito where there was very little doing. All coleoptera under stones Islands very close to one another.

(over.

San Benito (middle & East)

SBME

# "1,2,4,3. Under stones without exception.
" 5 Middle San Benito under stones Cramlyced dead in schooner's hold = (aug 5)

Cerros. July 18-1905

Collecting very poor, weather cold windy & cloudy. Collected 9 hours about southern part going up cañons, creeks dry. a fair lot of vegetation in bed, barren on steep cliffs excepting low weeds. Grasshoppers very numerous in southern parts. N end of Id in parts high & well wooded.

C

" 1 S.W. pt of island crawling in dry
" 2 bed of ravine, Mantis higher up
Slevin & Hunter colls, cockroach at sea

Natividad July 19th

Spent seven hours on this barren island pretty good collecting in tenebrionidae.

N.

" 1 Pale beetle & scorpion under cormorant nest, two cock roaches: dug out of sand
" 2 Under old shag (cormorant) nests & stones.

# Lepidoptera

Very little on the Benitos, see collection a noctuid pupa 2 specs taken under stones + one emerged. At Cerros pretty fair collecting in the canons. no S. Hilis seen. A couple of juniper trees had micros on them as on same on Mt Diablo California Apr-04. Probably pretty good night collecting & in N pts, poor weather for collecting. Nothing at Natividad.

A couple of fine reddish brown sphinges observed when off Benedictos but not taken.

## Mid-ocean.

M.O.1. July 22-05 some taken in calms lat 22°33'N. plentiful but not in big groups. On the way home Sept & Oct. seen from the Galapagos to a couple of hundred miles N of Clarion, a couple taken a little S of Clarion. A species is very plentiful in the still lagoons of the Galapagos Ids Albemarle, Indefatigable, none taken.

## San Benedicto July 26-05.

A mere barren rock. Did not go ashore here, Slevin caught two large grasshoppers which were very plentiful & mature, & feeding on the prickly grass. A small beetle observed while Hunter was digging out shearwaters' nests. A sort of wasp & a Catocala like moth flew aboard.

## Socorro July 27-05

Took a [cricket] small reddish brown Carabid like one in San Francisco but lost them. King observed a few beetles under a stone.

### Lepidoptera.

A small Thecla (? sp.) common about thick brush. Lots of flesh flies were numerous & bothersome. A couple [species] of Catocala like moths common & many in brush & under lava — none taken.

Clipperton (Atoll) Aug 10-05

An atoll off the lower mexican coast. Cockroaches & earwigs introduced. Coral sand beach. Did not go ashore

CC. 1 Cockroaches & earwigs taken from pail of tern eggs. Cicindela numerous & active on the fine coral sand beach, King coll.
" 2 On Clipperton rock, very numerous, King coll. Lagoon in atoll brackish water containing a fresh water plant, prans form in [illegible]. A small beetle ½ in long, black with rather long antennae observed beneath a rock but could not be taken. Lots of flies on atoll fond of skinks.

Cocos Id Sept 3-13-05

Raining practically everyday heavy showers. Very damp here plenty of fine big timber & rotten logs. Creeks plentiful soil very good. Very hard to get about except by following creeks. Insect life not very evident ants being the most noticeable insects. Cutting into rotten logs up the creek from Wafer Bay, many specimens of Coleoptera were taken

Cocos Id. (contd)

they were mostly in the larval stage a few in the pupal, larvae generally well grown. In fact it appeared rather early for Coleoptera though Odonata & the butterflies were then in a faded state. Insects mostly Coleoptera were found in the dense shaded woods & a fair collecting ground was in a clearing behind the Governor's house (good for lepidoptera.

Co 1 | In rotten wood a mile or so up Wafer Creek.

" 2 | One mile up same creek flying around the foliage during the afternoon. Only two specimens seen but they have been seen by the Governor.

" 3 | Coccinellids common on Hibiscus leaves (elm tree) Chatham bay, some in copula. — termites in rotten wood up Wafer Creek. Arachnid Chatham bay found in small colonies (5 or 7) on horizontal webs. Out pupae.

" 4 | Wafer creek dug out of a rotten log larvae numerous one pupa, early for adults.

" 5 | Centipedes under logs & banana tree

Cocos Id. (Contd)

stumps; millipedes in same locality — Wafer bay ½ m. inland.

" 6 Dug out of rotten timber up both Wafer & Chatham bay creeks, larvae common, a few pupae (in wood) beetle very common, the wood in which these bore is quite soft & rotten: found in same locality & log as #4. Adults in season.

" 7 Arachnids under stones. Water beetles in 1 small pool by creek. Carabidae rare (rather) under stones in creek bed. Other beetles (red) in rotten wood — rare. All Wafer Creek.

" 8 Orthoptera under rotten bark nr. Wafer creek, not common & very active. Myriapod under log — Coleoptera larvae in old log.

" 9 Millipedes under logs Wafer B., Arachnids Chatham B. as in No 3, Coleopterous larvae in rotten logs.

"10 Lucanids? very common in rotten timber, see (6) — large brown beetle far less common see (4)

"11 Single brown spec. in path back of Gissler house, fairly common but wild, others species principally at mouth of creek fairly

Co. Gess Is (contd)

" 11 common but late for good specimens
" 12 Small footed larva (plecoptera) makes stone nests under stones in creek. Coleopteran larvae in rotten stumps with nos 4, 6, & 10
" 13 Grasshoppers & crickets very much faded. (before nice green green with reddish) common in grass & sedges back of Gessler's house rather early for adults. Lucanid larva (12). Smaller cockroaches common near Gessler's house under logs larger sp. in a rotten log in multitudes, a third slow grey species taken with the active latter. Big brown hairy sp. nat. Chatham taken from tabs by Beck.
" 14 Ants found in rotten logs.
" 15 " " " common in rotten logs, cockroach in bunch of bananas
" 16 Mosquitos up Wafer Creek smallest swarming in old wood, spider on web larger beetle in forest up Wafer creek Cockroach on land.

The smallest red ant crawling on every stone I visit. has a fiery sting.

Though on the equator, the temperature is not high & the climate is very pleasant. While it is never cold it is [illegible] not hot either; consequently the insect life is not very tropical (Climate [illegible] cold currents & Mr Stewart has records of temperatures of the [illegible] water. All the lower [illegible] (which are all small) are dry; arid & [illegible] practically only one zone well defined. These islands rising over 1200 ft have several, on some islands (Indefatigable, Albemarle's g) have these zones well defined & plainly visible from a distance. In each case the southerly side) they are the greenest & most fertile & consequently the zones extend further down the slopes. SE are the prevailing winds which are very constant but not strong.

Rain — It rains much in the higher parts say 600 - 700 ft [illegible] & here the green zone begins. But on islands below 1000 ft the green zone is only rudimentary & not much [illegible] from these. [illegible] Iguana but the [illegible] zone [illegible] with dry zone plants extends right down to the water edge. [illegible] is very steep & it rains much [illegible] the lee side the green zone [illegible] considerably higher. Heavy showers occur from December till [illegible] on the higher parts

but usually are of short duration. At other times of the year there are annoying drizzles but no real rain. Of course during the rainy season (summer, then warmer) insects are more abundant esp. carabids & longicorns & temporary pools (Chatham) are teeming with water beetles) & sphinx & noctuid larvae are conspicuous)

Zones. Though the zones are not distinct on all the islands they are nevertheless traceable. Iguana Cove Albt. is green all the way down on the weather side but the zones are clearer on the lee side. Indefatigable has a well defined series of belts & Banks bay Albt. a fairly good one. Certain plants & shrubs live with very rare exceptions found exclusively on the shore such as mangroves & several bushes that form a green background to the sand beaches & lagoons. This may be called a shore zone but it is very limited in extent. Next is a wide arid belt the dry zone where the cacti flourish best & where they & certain bursera & spiny legumes predominate. On a weather shore this belt seldom extends higher than 5 or 600 ft. but goes considerably above on a lee side. This is the commonest & practically the only belt in low ids. & on high lands merges into what may be termed the light green zone. where large trees predominate

Galapagos Ids.

in species (at least) + which in some Ids (Erythrina on James) are found on the lowlands. Guava + another large tree are common in this light green area + usually ferns begin here. Castella extends throughly into this zone but is properly a shrub of the green zone where vines + verdant vegetation are at their thickest. This zone is rather abruptly separated from the lower belt where creepers etc are also found + moss like plants as on Indefatigable where the rise is very gradual.

Scalesia the big tree composite is perhaps the most characteristic tree + indeed with few exceptions the only tree [+] peculiar to the green zone. Castella is more or less a shrub + the big tree of St Thomas settlement is only found there! On SE Indefatigable the green zone (damp + dreary + practically impenetrable without the aid of a machete) commences at about 500 ft. The large tree heliotrope is conspicuous in this zone also large nettle. Considerable on Indefatigable (SE) moss tinned everywhere + creepers are abundant + it is rich in ferns. This green zone sometimes ends in open lands as Chatham + SE Albemarle or into a thicker brown zone of beds of ferns + brown lichens growing on Castella + heliotrope etc + on Inde-

# Galapagos Ids.

## Brown Zone

[illegible] whose summit we did not gain. The brown zone (SE) contains forests of large trees growing close together & probably covered with lichen giving them a brown appearance. Open country probably exists higher up. Chatham & Albemarle are inhabited but a good deal of open country already exists & brown lichens grow on the scattered shrubs as well.

& ferns in [illegible].

## Insect fauna

The shore zone has its peculiar Coleoptera — burrowing in the sand a variable yellow beetle (tenebrionid ~~[illegible]~~) on beaches, a soft cerambycid shaped beetle under wood above high tide — comes to light. Small rhyncophora (several species) found in stems of shore brush & under logs etc. At Tanks bay a cicindellid. The [illegible] seed harbors a small beetle.

The dry zone contains coleoptera feeding on its own plants, cactus, legumes etc. It is here that the tenebrionids (Stomion) are commonest & also a small [illegible]. Large green calosomas are found here in the wet season also [illegible] [illegible] [illegible] top [illegible] tree on Chatham & Chs where dry zone is pretty fertile in season. Green calosomas usually don't go above dry or light green zone but the only one I found on James was in its [illegible] 2,000 ft green zone & at St Thomas they were plenti-

# Galapagos Ids.

feel in a Meadow at 1500 ft. green zone + practically the end of tree belt. + on shore of Same Isl, could only find elytra.
Light green zone. have certain [illegible] (weevil) found only in Guava (Indefat. + Chatham) besides various minute beetles under bark + to some extent the Chrysomelidae. smaller carabids commonly here + plentiful in here + in lower zone + even some in green zone. __Beetles follow their food plants.__ is a common rule there. Green zone, big compositae food for several beetles, that + croton + legumes most popular to insects. Erythrina on James has many minute bark insects. Big cerambycids etc. + carabids here. Scalesia small tree down [illegible] + its guests, less plentiful. (nothing much in fern belt (brown zone, small carabids) somewhat like green zone. a few minute beetles. In more open country. [illegible] (pastures etc) several carabids, scarabeids, are peculiar, + in green zone + in pasture land coccinellids occur.
Of course some beetles are found in all zones but more commonly in those pointed out. Water beetles + carrion beetles + parasites follow their habitat.—

# Galapagos Ids.

Best collecting places — All the larger Ids are fair as collecting places Chatham ~~[illegible]~~ & Chs Isl. – & parts of Indefatigable SE & Albemarle (Villa Mil). Abingdon though good & green is not very rich. (Of course the collecting on all the islands is poor & in the dry season very disappointing). Hatchet work (opening trees dead & removing bark) was indispensable, as also turning over stones, but no "cut above" specimens could be found anywhere. Sifting is not good, rubbish heaps are not good for beetles here & beating with few exceptions useless. Beat one part of a bush & shake all the insects out of the other & even then the foliage on these trees is very scattered & only a small portion can be handled at a time. Besides these little beetles, [illegible] & Chrysomelids take to flight right away. I usually clapped the cam bottle over inflorescence or gently tapped [illegible] over net. December ([illegible]) January Feb & Mar the height of the collecting season. Dead cattle etc. turtles furnish scavenger beetles, & carabids are best caught under stones. Green Calosomas have multitudes of lepidopterous larvae to feed upon [illegible] [illegible] [illegible]

# Galapagos Ids

shrub in search of these. Did not notice that the Coccinellidae had any guests till late in trip. (Coccinelid staphylinid)

## Gardner Isd (nr Hood)

Sept 1905. Spent a day here. Here the vegetation is scrubby & dry & the island very low. Collected chiefly on N E & N slopes of Isd. All coleoptera taken were found under the larger stones & the largest tenebrionid was most plentiful. Judging from the no. of elytra (some bright green = Calosoma & little scavenger) it did not appear to be the right season for insects. Schistocerca & Sphingonotus very rare, about 5 seen. A single microlepidoptera found on a stone, Scorpions rather scarce. Spiders fairly common, one species making a curious nest having a broad disk & conical tower

Galapagos Ids
Coleoptera
Sept 27.05



Gardner Id (nr Hood)

Spent Sept 27-05. on this Is. Here vegetation is dry & scrubby as on all the lower Ids. Collected mostly near shore on NE + N sides where coast is not so bold. All coleoptera collected were taken under the larger stones larger blk Tenebrionid was the commonest judging from the no of elytra, some bright green, it did not appear to be the right season for insect life. Beetles under stones larger tenebrionids commonest. Rhyncophora in dead wood.

Hood Id. Sept 05.

Dry low id, Coleoptera scarce many beetle elytra found, Calosoma. tis etc. All taken under stones

Gardner Id. (nr Charles) Oct 3/05

A little Islet. beetles under stones

Champion

Coleoptera under stones 1 Sp. Did not go ashore here.

Hood + Gardner Ids. Jan Feb 06

Beetles slightly more common now perhaps but apparently too dry for much rather early Coleoptera more numerous on Gardner than on Hood Id. Taken from E + S sides esp. (Weather side). Two exam-

~~ty~~cids sand beetles on beach under logs (H[illegible]) sand shore, very agile & fly easily do so when disturbed specimens pinned up.
No Calosomas found anywhere here at any season. it must be a dry year.

# Hood Id Jan. Feb-06

Hood. 1. On the very summit of Id. 600+ft. under stones-larger beetles under stones usually play possum but run agilely if disturbed as also smaller ones, which are lead powdered. Slightly greener at summit. Rhyncophora on stems of green succulent viney bush which is common on sandy shores where beetle is found also. Large beetles, a couple in copulation.

" 2. SE pt of Id. (Albatross place) under flat stones, nr shore; beetles of this kind always more plentiful as there are better accomodations for them - i.e. flat rocks + soil.

" 3 Elater caught as it alighted 75 ± ft. alt. Cerambycid larvae in croton nr shore. Hump backed beetles taken from twigs of Bursera which had fallen to the ground. Found a few larvae but no pupae. Wood dust beneath infested twigs. Several beetles in same twig + often together. Beetles probably hide therein in the day + emerge by night? as the galleries are open. Found also in branches of thorney legume with the yellowish raceme flower. apparently common.

24
Feb 06.

Gardner Id. (nr Hood)

Hood.

" 4 . Beetles + larvae in thorney legume Rhyncosphora in old deserted gallery. (Gardner)

" 5 All under stones - E Side mostly, & near shore.

" 6 Thorny legume.

Hood Id. May-June 06-

Dry but fair collecting.

" 7 Parasitic on Diomedia irrorata (albatross)

" 8 Two large scarabeids under recently stretched sealskin, a little ways in the sand; skin a few days old. larvae in vicinity of skin; Beetles common a few inches under coral sand, several usually revealed at one scoop of hand.

" 9 Gardner Id. nr Hood. Spiders fairly plentiful under stones where was found their dust spun nest ; beetles fairly common under stones near shore rather sandy E side a few green calosoma elytra seen.

10 Hood Id. nr albatross rookery; largest larva in croton, 2 thorny legume larvae =#11. ground beetles under sticks etc by sand beach, rhyncosphora plentiful some under sticks + others with the larvae in bottle (long-

# Hood Id

May June 06

Hood

10 cont'd straight one doubtful) common in various
succulent shrub of shore.

" 11 Gardner Id. in thorny legume imago
(1 doz taken from one boring, allways open
when inhabited) with adults ;
presence betrayed by dust under
dead limb usually about = 1 / thick
& hole usually wide enough for one
specimen.

" 12 Lana same as 11 short small beetles
common in Bursera 200 ft alt. boring
under bark: ground beetles & weevils)
rather scarce under stones 200± ft
also cricket, tapeworm in dove's entrails.

Charles Id. 26

Oct. 1905

Gardner Id (nr Charles) Oct 3-05.
Beetles under stones.
Champion Id.
Coleoptera under stones
Charles Id. (Post office bay) Oct 05.
Beetles rare, under stones where many Calosoma elytra were found. Just back of beach (Cormorant bay) is a shallow lagoon (all enclosed) & not altogether salt. in a small pond spring I found a few Dytisci.
At Blk Beach roads it is also dry at lower levels & abounding in thorny legumes. up at 900± ft. it is greener but rather dry at this season. The interior of the island over the pass 1000 ft. are many lemon & orange trees & the top of the island 1760 ft. is a round nub. where it is often damp & foggy & windy. 1300± ft there is a spring (perpetual).

Cls

"1 Taken from bird eaten oranges 1100 ft. back of highest peak.

"2 Larger beetles common the spring near the summit of lemon wooded nub; smaller beetles in the water among & under leaves where water trickles over. Latter worm (annelid) in the water. Larger bee-

Cls. 2 | Flies very common, smaller also common
" 3 | Elater rather rare & very active 1100 ft level under stones, larger beetles also same locality rare & quite active.
" 4 | In small pool on W end of lagoon, Cormorant bay. water brackish. Took all I saw,
" 5. | Ants found under stones 1100 ft level to sea level, ants belligerent colony not numerous, pseudoscorpion rare under stones 1100 ft & lower, single beetle 650 ft level under wood, only one seen
" 6 | Lagoon, Cormorant bay, beetle on my person, culicid in lagoon, spider in web, dark hemipter on $H_2O$, light Hemipter in $H_2O$.
" 7 | Lagoon, Cormorant bay.
8 | " " " . D Rather common in old logs, low elevation.
9 | Cormorant bay, under stones, high & low elev. Isoptera high & low elev common in rotten logs, dermestid larvae under stale cow, crickets 1100 ft. not common
10 | Earwig not rare high elev. dermestid on beach. larva 1100 ft under stone hemipter rare, under stones 1100 ft. Spider 700 ft.

Charles Id. 28.

Oct 05

Cls.

" 11 Quite common everywhere on isle, not near moist places, under stones

" 12 Very common 1100 ft., many under a single stone, rare below 700 ± ft

" 13 Under stones etc not common Black Beach.

" 14 Common in rotten logs 600 ft above & below

" 15 Common under stones.

" 16 Gray cockroaches 700 ft. under leaves & logs in shade, others high & low alt.

" 17 Black beach in branch of a tree 100 ± ft.

" 18 About 700 ft. up Black Beach Roads, not common.

" 19 Under stones 700 to 1100 ft.

" 20 Orthoptera in decayed wood, Centipede (Chatham Id

" 21. Under stone 1000 ft I

" 22 Dead under stones smaller scarabaid alive 800 ft elev. remains common under stones 800 ± ft to level

Feb. 06 Cormorant Bay.

Evidence of cerambycids in thorny legume. White grub & pupae in Xylocopa nest in dead bursera trunk, beetles under stones, just fresh Rhyncophora on person.

Blk Beach Rds (over.

Blk Beach Rds. Feb 06

Green Carabids now emerging up to about 400 ft. fairly common Big brown scarabids seen dead in plenty, none alive. Up at spring Hydrophilidae not in evidence though smaller species a few. Much evidence of beetles in thorney legumes, but mostly old.

May 15-06.

Good time for Coleoptera green Calosoma gone (1 left) seen by Gibson & King - plenty of dead specimens, no brown scarabeids. only old remains & a couple of their larvae taken a little way under ground under stones near summit. Plenty of beetles under stones etc, a minute convex blk beetle 2 specms found in rotting bean pod on tree on spring. No hydrophilidae seen.

Cls 23. Under stones etc common on summit under manure, also at pass under stones etc.

" 24 Coleoptera larvae, 2 larger ones summit 1760 ft under manure. Earwigs very common at pass & summit under stones two ♀♀ with broods observed. 8 young or so under each mother in little depression, large beetles rather rare under

24 " ~~under~~ stones moss leaves at spring in scop of branches —— filled with leaves. — active —— Water beetles common at spring under wet moss, leaves etc. Little brown staphs & one tiny convex beetle in old pecked (by birds) bean pod at spring, larvae of little convex beetle: in bean pod also.

" 25. Remains of chafer common at 1000 ft to summit under stones etc. Bug not very common, at pass under stones, elaters common & active — esp at summit under old manure & under stones, Ant, some winged, at pass & summit common under material few to a colony.

" 26 → Large beetles under stones leaves etc 1000 ft. Coccinellid on lee side of summit which is bald except for two sp. of heliotrope & another weed or so. Coccinellid on Heliotrope leaves also one under stone (1100 ft Ochrom). Chrysomelids in fair nos on small Heliotrope sp & a few on larger species

Visited place May 23 — 06 —

Getting dryer all the time. Around old native camp at beach landing where there are remnants of old hides

+ bones dermestid eaten around stones etc.
Under these stones were the larger blk
beetles, some newly hatched (brown) + smal
ler beetles, no live dermestids but one found
+ blk spiders making webs under stones
seem to feed much on beetles, many wing
covers of troct under spider webbed stones. Wood
borers dead + in pieces in thorney trees
no adults alive seen, fine Dundaw sp
of silvery cerambycid found dead in thorney
branch also James' sd cerambycid (brown)
at foot (dead) of well punctured bean trees at
spring which were probably infested by the beetle
as a few cerambycid larvae + many old borings seen
little flea beetle same as on summit also on
heliotrope on shore

Cls  May 23 - 29 - 06

" 27 | 5 carabids at shore - past season under stones many elytra larvae same locality, also elaters + other beetles larvae on heliotrope at shore cerambycid dead under bean tree Dascyllid-like beetles in tree's crotches under leaves - one on trunk - little beetle - elytra + thick short larva in spiney tree

(margin note: Also seen at St Hymans South Allen side 1300 ft)

" 28 | High + low alts at beach, brown beetles = fresh newly hatched ones found just under soil sometimes.

Cls

29: Pupa of E odora. at spring - Chrysomelids see notes above. Cricket low alt, carrion beetle at shore - floating (imperfect) beetle in bean tide

May 30 June 4th.

Brown scarabeids, larvae full grown + half grown 1 - pupa found + several fresh beetles under stones + a few inches under soil among roots etc. On weather rim of broken crater 1650 ft. SW side or summit under old manure little elaterids common, also tenebrionids. Inside + on sides of crater, castella bushes have beards of lichens, on their trunks limbs etc in this is found the large grey Katydid + also hemiptera -

Cls - 29: Esp hidden in lichen growing on Castella high alt also in wood common

.. 30 Centipedes 600 ft Slevin Coll. Spiderlike (insects 3) under stones + digging holes (oblique on trail + in other places, dug out one. holes several inches long + deep, much soil at entrance to burrows + often blocked by it, ~~insects~~ nocturnal. Hemiptera common on weather side of big mt's crater in castella's lichenes, pupa + larvae of brown scarabid on weather side

Cls.

" 30 of crater, under stones at roots etc. + in the ground a ways, good soil there.
" 31 All on summit of big Mt. elaterids common under old manure also larvae + under stones. green beetle 900 ft. a jaw bone. Dascyllid like beetle under stone high alt Alexin + myself calls—
" 32 Big ants common under stones on summit + weather side of crater. also under manure, cocoons of same Colonies rather small, making galleries under stones, no big queens seen 2 ichneumon flies apparently living with them, live together in little groups among them; pupae of ants (same), 3 curved beetle larvae under stone + in soil 1700 ft crater; long larvae under stones etc. Small ants, queens soldiers + workers in big colony under rock + in gallery, pupae of ants (same); ants sting + bite desperately, soldiers observed carrying pupae to safety = top of big Mt. 1760 ft.
" 33 Summit of Mt 1760 ft. under manure (old), stones, etc — very common —

Chatham I.d. Oct 1905.
Wreck Bay.

Quite dry now = before wet season, & not much collecting.

Cha 1 Under stones. low alt. Perhaps some Clo beetles - Clo Lobble

" 2 " " etc

" 3 Spiders high altitude on almost vertical clefs [Bugs from Clo Lagoon

" 4 Under stones!

---

Jan. 06.

Rainy season well in now - puddles all over - insect life rather plentiful - esp coleoptera Vegetation green.

" 5 Quite common under stones by way-side near beach, found on different days under same stones, a pair in copula, two taken running up road 500 ft alt. all these ½ mile from beach.

6 Cerambycid 350 ft alt under bark of tree. Centipedes under stones. common

7 Odonata about 1000 ft. alt. in pool by road. many aquatic plants etc. Hemiptera on summit, common, spiders & crickets under stones

8 Beetles common in rain & more

# Chatham Id. Jan 06.

Cha 8 | dinable pools from shore to summit, summit pools 2000 ++ - more drinable containing lemna etc. (plants)
" 9 | A couple of water beetles ~~in copulation~~ ~~go up to summit~~ in copula, beetles under stones some large rhyncophora on croton etc in copulation. Go up to summit beetles low alt. Spiders on webs 1000 ft. near $H_2O$.
" 10 | Big scarabidae a couple in copulation. 10 ft. alt. or so under stone & old ~~rotten~~ gunney sack. some elytra under dung & one under gunny sack dug out from ground 1 a 2 inches
" 11 | Very common in every puddle
" 12 | Hima brownish, under stone low alt. 2 blk ones on vine 250 ft. up road common vine
" 13 | Biggest beetle dead, in telegraph pole (of leguminous plant) Gyrinidae, 1800 ft. alt up road in pools (with lemna) not in large swarms, dytiscidae, common in pools high & low alt. odonata 1000 ft., elater under stones, Carabidae common under grass of grassy summit 2250 ft

Cha.. Chatham Id.

14 Under stones, low alt.

Bassa pt. Feb 06.

The large green calosoma observed to climb stems of shrubs, seen during the day & running about [illegible] looking for larvae which were numerous on shrubs

15 Calosoma running about on ground, fairly common on croton, tiny beetle on beach in some drying seaweed [illegible] plenty on Gifford's hat at beach, other beetles under stones & boards on the beach

Sapphire Cove. Feb 06

Otiorhynchus very common

16 Elaterids resting under croton leaves Chrysomelids sometimes feeding at croton flowers but more often congregated on food plant a trifoliate yellow-flowered legume of creeping or ascending habits (about sea level) beetles active — make good leaps

17 Small beetle on my person near shore Xylocopa larvae from bees nest in old [illegible] limb, white [illegible]? parasite in one cell

Cha. Chatham Id.

17 other parasite observed devouring larvae.

18 Beetles readily attracted at light taken mostly at night, during day under planks very active run & fly often when disturbed habitat sandy places near shore.

19 Polyneoptera exceedingly common usually on bottom & copulating. drop off leaf when approached, others under planks near shore.

Wreck Bay July 06

Quite dry, little showing, most ponds dried up. At foot of hill fine permanent water lake 1/5 m across & very deep. Some Agrionid larvae taken & several Wetlands seen, water beetles common. Big brown chafer apparently common in season, come out of round holes which are not grouped together though several were rather near one another, holes especially on grassy hills near the summit. Many dead beetles (chafers) seen & in burrow

over.

Sappho Cove. Feb 06.

Silver gray. (Ergates. commonly feeding on croton, were also paraliting in a spiny green shrub of the sea shore & cotton branches also gave evidence of a borer probably the same Cerambyed = Jan 21. Borings found in Euresha. Cha 17 beetle larva fed melandryid. I kept 2 several days in loose sawdust & fed them Xylocopa larvae which they ate readily. They remain in a curved position. I inserted each in a separate Xylocopa cell supplied with a larva Feb 19-06.

Wreck Bay Feb 06

Big green carabid everywhere at lower altitudes feeding on lepidopterous larvae (sphinx caterpillar) which they ripped open. Climbed herbs & shrubs in search of larvae. Seen during the day especially late in the afternoon by the roadside, several may be seen eating one larva

Cha 19) Gyrinids beyond found a gaff in a little pond. Scarce. Rhyncophora abundant all over piece of beetle under stone 1100 ft. 2 longicorns at light on beach. also 2 light colored beetles. (Tenebrio-

Chatham Id.

Cha over dead specimens were common on rotting grassy places at high ~~altitude.~~ rare below hacienda 900 ft. Lower land collecting inferior at this season, many trees now leafless (Mattazena (acacia) a hard heavy wood used for telegraph poles infested by Ergates. 224 brow (see notes) only two living beetles seen a few larvae + many borings often blocked by the dead beetles full of dead bark, biggest ~~[illegible]~~ 2 alive several dead ~~[illegible]~~ under same bark, often larvae bore commonly here in poison tree Hippomane common low alt.

20 Pretty common under stones low alt.

21 ~~Not beetles.~~

22 Larvae + pupae under moss etc growing on a stone surrounded by shallow $H_2O$. Pupae in rather

Crater lake

dull. common 1800± ft. two (3) carabid larvae 500 ft± under stones & earth Gymnotus in a

39.

Chatham Id.

Cha. sort of poly creek. (500 ft. ...)

Sept. 06.

Did no collecting except of some beetle infested wood. Very dry here, but a few plants are sending out fresh shoots.

Oct 15 -17

2 Cerambycids (Cyrtus) emerged.

see pinned specimens for later emergence.

(Galapagos Coll.)

40.

Bar. Barrington Id. Oct. 19-24-05.

Much like Hood Id in aspect.

(1)

2. Small beetle on my hand, very common under stones.

3. Four light beetles found dead in a seal skull other beetles all under one stone.

4 Not common, under stones.

5 " " " "

Daphne Id. Nov-05

2 sp. Tenebrionids very abundant.

41 1

# Indefatigable Oct 25-28 - 05

Ind

## East Indef.

1. Big Cerambycid at ground zone [?] of Opuntia; minute beetle on my person, Rhynchophora Beetle in a damp decaying root of succulent rather rare; brittle leafed [illegible] brings in root not exposed.

2 Common on [illegible], some in [illegible] observed laying eggs when in Opuntia

(3) ~~Eggs~~

4 Aquatic beetles under [illegible] stones in very shallow [illegible] creeks & lanes & small pools in water [illegible]

5 Beetles under stones & weeds on sand dunes.

Puerto del Aguada [?]

Academy Bay. Nov. 5-16

Ground zone dry [illegible] Big Cerambycid (Trachyderes [?]) common in ground zone in Opuntia, some in pupal stage, living in damp rotten [illegible] 2 [illegible] ) [illegible] 500 elev. under bark of rotten trunk in which [illegible] was living in heart of [illegible]

[illegible]

42

Ind. 6 Common in rotten logs, green zone now in pupal stage

(7)

8 Carabid under dead tortoise 300 ft. two larvae in rotten wood, green zone 700 ft. broken beetle in dying limb

9 Largest beetle in bottle, found in ___ 300 ft. 2nd size (blk) common in stone under stones, small beetle 500 ft. some flying, some a (elaterid larvae?)

10 50 ft. under stones

11 Under cactus stones etc S Seymour

S Seymour Nov-22-22

much like Fossil cove, very low beetles scarce, most common under dead & dying cactus leaves also under stones on SW pt of Id.

Fossil cove. Nov-17-19 = NE Indefat.

Low & dry with rocks red soil between lava beetles rare under stones. N Indefat. Nov 24-30.

Dry way up to 600 ft. or more hardly any coleoptera under stones a few small species in twigs — on

43 Ind. A: Elomra

~~Coyotes~~ & elater taken at light 800 ft. Academy bay (Indefa)

6. ~~Common in rotten logs. green zone none in tropical~~

N. Indef.

12 elater at light 300 ft., small elater like beetle, tiny brown beetle on my person on 300 ft. oval beetle & little blk beetle in dead twigs

Dry belt up to 1600 ft at least,

13 Small elater in twig all on sandy shore

14 S. Seymour long antennae beetle at light near beach running rapidly pale & spotted tenebrionids on sandy beach running & burying in sand when disturbed

15 Under stones & cacti.

16 Daphne Id. large & smaller beetle in large nos. under stones on (S. side inside) of island crater. also under cacti & apparently always near it. Beetles food for numerous scorpions.

Academy bay Jan 18-22-06

17 Dug out of fallen tree composites at beginning of ~~Many from zone 450 ft Beetles (haltica) beginning to emerge~~ many pupae & larvae found [illegible] [illegible] [illegible] elat 1500 ft

44

Ind.

18 Permarth & larva on Academy sailing from Indef. Other beetle taken by King under Hippomane tree near shore.

19. Dug out of Psidium (guava) 350 ft alt. little conny beetle. sp. & about like (2), also other small specimens flying in the morning close to ground 2-6 ft.

July 20-24 06.

S. W. Indefatigable (near Conway B.)

This place (Dove roads) is where an old overgrown trail leads to a small plantation (deserted) 1½ mi inland. Tufa formation here a cliff along sandy shore, rocky elsewhere common. Very dry & flat here, little cactus, mostly croton & dry bunch grass. July 21 - went up old trail. Ascent as usual on this island very gradual. 350 ft elev. big trees & creepers & decumbent vines soil slushy after 650 ft. practically in guava zone very different from that of S side. no nettles or morning glories but many fine big trees Psidium (guava) etc. Rain next morning soon got into composite & ferns, rain went up 1000 ft.

Annoying drizzle here + 650 ft
in night. Trees = Psidium galapageium,
Pisonia floribunda (big wide spreading tree)
+ Scalesias, + what was called Castela =
Zanthoxylum pterota
Through an oversight.

Ind. Ind. nos. 17. 18 + 19. are again used
but by examining contents of bottles
you will be able to locate specimens.

17 Beetles in shelf fungi (Polyporaceae)
growing on Scalesia (compositae) 950 ft.
Green zone commenced 700 ± ft.

18 Beetles in old fallen Scalesia trunk
950 ft, also pupa, little beetles =
shelf fungi ex from #17, larva
in compositae also. Small beetle
50 ± feet (Beck)

19 Big larva plentiful, boring
in old Scalesia etc. in their zone
(rats burrow after these also Scolo
pendra). 2 smaller larvae just
under bark in compositae proba-
bly young Mallodon.
Notes. on Dove roads. Dry season.
Mallodon mostly in mature larva.
1 pupa + 3 adults dug out. Feed
almost altogether on Scalesia (dead)

whose wood is soft + weak
Hard wood tree = Psidium (Guava)
(zone 300 ft to as high as we went
1000 ft.). Dead trees of this perforated
with beetle holes - Prionid sp.
only, larva. This beetle found
elsewhere only on Chatham + S
Indefat on same tree, which is
also found so plentifully on James
+ Albemarle but no trace of bee-
tle seen. Not common on Chatham
but fairly so (probably) on Indef.

N. Indefat July 24. 5 hrs ±.

Shore Cerambycid-like beetles very ac-
tive about Mangroves (Hunter) + com-
mon at S Seymour (taken by light
at night in Nov. 05. Few storm
remains near shore.

S Seymour. = Ind. label. July '06

Low dry barren Id. separated by
very narrow channel from N. Indefat.
A piece of rounded (Opuntia)
which had become rotten + partly
soggy + hollowed, furnished re-
fuge for several species of beetles.
Tenebrionids + scorpions under
fallen cacti etc. Rhynchophora.

ra breed in cactus (opuntia
leaf & branches, excavate short holes.
& pupate only a little ways in. A
sticky exudation comes from their
gallery, common.

Ind

20. 3 adults & 1 immature Rhyncophora.
commonly inhabiting cactus,
presence often detected by exudation
Big tenebrionid under goat's head,
others inside cactus (old)

21 4 Rhyncophora in old cactus,
others in damp soggy piece
(also mites).

48.

# James Id.

Large + comparatively fertile Id. Barren lava fields on S + E pts. Steeper + greener on W.N.W. side (James B.) Very steep here. Crater surrounded by Acacias, etc Erythrinas here. Burros + hogs clean out undergrowth pretty well. Green zone 1000 ft or so where large Scalesias grow. 2500 ft. greener + much grass + ferns on tree trunks.

James Bay. Best collecting of Id.

~~Dec~~ Dec 22-05 Jan 5-06.

Jan. 1 A common sp at high altitude. Larvae pupae + adults found in rotting Scalesia trunks. Adults plentiful but still rather scarcely for species. Larvae make oval passage ◯ + pupate therein in a chamber; a few larvae attacked by fungus + apparently mummified. A few pairs of imagines taken in same boring together but not in copula.

2. Found in same wood as preceding but much less common. 3 ♂♀ [illegible] larva to emerge. Possibly

Jan. 2 in more rotten wood than #1 + much less common.
" 3 Found in same wood 1400 ± ft. larva pupa + adult rare.
" 4 Found in dead branch of spiny legume with spherical yellow flowers (Acacia?) near shore.
5 " " " " et larva rather rare.
6 " " "
holes in branches indicated ext of insects: few pupae + larvae seen. beetle probably fairly plentiful reared one from pupa which hatched next day. Infested trees on burro trails. In infested branches bark peeled off or split + burrows broken + bored then off. in passing thus indicating beetle presence.
" 7. Boring in the trunk of Erythrina (dead). A pair of pupae found. hogs break rotten wood + get grubs also rats. 500 ft.
" 8 Under stones common 50 ± ft.
" 9 Ants common under stones 2000 ft. taken from 2 nests. white

50

Jan.

9 grub - ichneumon larva (wingless with pointed abdomen) feeding externally on larva & pupa of #1 + 2. Staphs. under Scalesia bark 2000 ft. little convex beetles in tree compositae (Scalesia) under bark & in wood, also single brown one. Imodelbid not rare on (Erigeron?) flowers 2000 ft. Also single little brown (spotted) beetle.

" 10 pupa of #1. piece of shelf fungus on tree 2000 ft. with beetles only one infested one seen. (Several taken Jan 06).

" 11 Cer Arcuate larva out of Xylocopa nest in wood, also plain larva. 2 pupae of no 3. in Scalesia under bark, also wire worms (2) Blk beetles under stone 2000 ft. Ichneumons in burrows of #1 + 2.

12 Taken from Erigeron low alt. old branches.

13 Cermatid + Carabid on ship board. Buprestid? larva in Erigeron (Acacia?) Smallest beetles active under bark of Erythrina 500 ft. larger brown

51 *(This Erigeron may be something else)

Jan 13. ones in twigs of same; 3d in size with protruding wings under stone 300 ft.

14 Very common in Erigeron* making much sawdust. larva + pupa also in Erigeron.

15 Shelf Fungus (10) several infested ones seen growing on prostrate Scalesia 2000 ft!

16. Forever 5 pairs under fern roots on tree trunks 2150 ft. Larvae in holes in rotten wood. 1200 ft (Coleoptera)

17 A few very minute beetles in tree composite (Scalesia) on summit. 2750 ft. Elaterid larva under old bark in damp rotten wood. + under bed of fern roots. 2150 to summit. Beetle larvae + pupae in dead wood. all (Scalesia) — (near?) wood.

18 Carabid - (Calosoma) under Scalesia roots (summit). Nos 1 + 2. up to summit

19. Cerambycid on summit in rotten Scalesia twig. 2 elongate larva under stones 2150 ft. Rhyncophora larvae + pupae in damp rotten wood + in old twigs + the wood (Scalesia

Jan 19. Staphs from 1000 ft to summit. Small convex beetles under bark also brown one. other 2 small but larger ones. on my person. 2250 ft.

20. Hemiptera 2150 to summit under fern roots on compositae. where beetles were found. one elater found in rotten wood Plynch-19

21. Dug out of dead + fallen Scalesia mostly in larval stage (Jan 2-06). but some pupae + beetles. Pupae in chambers. Larvae make more or less horizontal galleries. 1500-1800 ft
8 from Indefat. Jan 06

Note (later on #21) From dead Scalesia. 1500-1800 ft. dug out 5 pupae, 3 ♀♀ + 2 ♂♂ enclosed in cells made by closing + rounding out larval passage. 2 shortened larvae. One larva pupated about Jan 6-06 + a ♀ pupa emerged. same day in morning 6-12 a.m. Freshly emerged beetle has elytra quite soft abdomen long + protruding, light yellowish darker dorsally + on anal flaps

53

Jan.

21. Wing covers creamy white, head abdomen & legs dark brown thorax lighter on edges & head also near occiput. Wings extended beyond elytra. Beetle lays flat & quiet & exuded some water-like liquid

Jan 10 another emerged about noon.

" 22. Larger beetles in green zone small ones 1200 ft. in Scalesia.

Fine wood beetle collecting.

Beetle ~~#~~ 1. sp. found in Barn owls stomach (Hunter).

Aug. 5-9-06.

Very dry as compared with 1st time & most trees leafless.

" 23. Cerambycid larvae (big & ~~little~~) common in Scalesia common in green zone - are also found in bursera & ~~lower~~ lower altitude & high also

" 24 (75 not cutting) Wire worms out of rotten punky bursera stump 1200 ft.

26. All under loose Erythrina bark (dead), bark dotted with ~~little~~ holes as also soft

54.

Jan 26.

wood underneath (made by brown beetle in bottle 50± dev.

Put away 6 pieces of infested wood = 2 Erythrina branches found below big tree (Erythrina) at beach. These trees are especially chosen by Xylocopa for galleries, being soft. Found a couple of coleopterous parasites in other logs (Melandryidae?) & put these away on chance larva in pseudo pupal stage. A little ways in Scalesia belt. ~~Lygates~~ Mallodon etc. larvae & minute coleoptera = 1 Scalesia. 2 Acacia(?) branches infested with Lygates? many trees thus infested 1 Croton — ~~Dry~~ Dry & dormant season now. not much of anything around.

Sullivan Bay. July 27 – Aug 5 – 06.

Very unprepossessing place, much fresh lava. ascent gradual. few trees, dry. very little about. Went 6 miles in = 750 ft.

55.

Albemarle Id.

Brattle Id. near S Alb. a broken down tufa crater.

Box 1 under stones J. S. Hunter

1

1905

SA. South Albemarle Oct 30 Nov 4 - 05

Villamil at base of Big Crater Mt. San Tomas settlement 1,300 ft. elev. Collected at low alt. & not more than 2½ m. inland. Water beetles in water holes up road. On the stumps of the stone-bearing Poison tree (Hippomane mancinella) were found Isoers (Curculionids) & a few mature beetles under the bark. In dead branches of the same sp. of tree were found larvae & imagoes under the bark, wood beetles. Smallest water beetles up in salt marsh & sand from shore - low alt. Beetles fairly plentiful under stones. It appeared to be the commencement of the beetle season.

Albemarle season. plentiful first in October

SA

1 Under Hippomane bark, early for these insects

3 Not rare near ditches 2 miles up road.

4 Dytiscidae in water holes in vegetable garden. 1½ m. up road, common. Hydrophilidae same locality rare. Odonata larvae in pool 1½ m. up road. Small blk. hemiptera ... same locality. Small beetles & larger brown ... from brackish pool ... m from sea

56

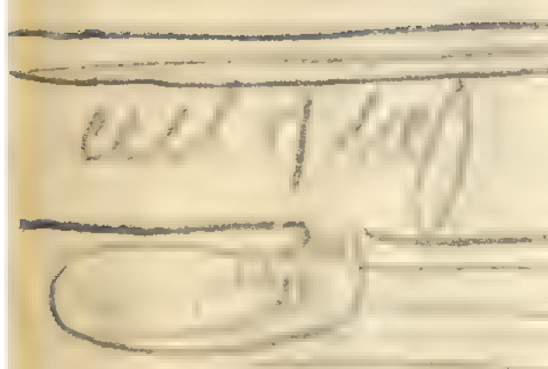
S.A. 5 Big beetle dead in pool, small beetle in wood box.

6 Larvae boring in wood - under bark of Hippomane beetles found in same. Not rare - but too early for them.

7 Common under stone - bark etc.

Mar. 4-14. - Villa Mil + Bull Bay. a few miles west. Quite brushy about shore where lagoons harbor somewhat brackish $H_2O$.

Low altitude collecting. Wet season.




Melandrinae? in Xylocopa cells in pseudo pupal stage + a few in small larval stage. Pseudo pupa in a hard cell of their own. Xylocopa nest in Hibiscus (old wood) a few miles below Villa Mil. / Handsome silver colored cigale? (commonly found on Croton) but no croton seen at Villa Mil. Beetle taken on Mangrove which are numerous / Turtles killed by natives (some are left lying on their back for days on the hot sandy beach + die from effects) infested with dermestids + their larvae

" 8 2 larvae + 1 pupa common on roadside under rotten bark + stumps of Hippomane + in logs of same. Small coleoptera larvae under rotten turtle shell on sandy beach. Minute convex brown beetle under rotten tortoise. Little convex blk beetle [illegible] in [illegible] + the larger beetles under

57
SA 8

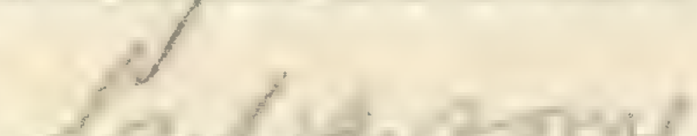
~~turtle~~. Largest sp. of weevils under a dry rotten beach log in company with small elongate weevils (pygmaeus) & middle sized sp. = (1 3h. In succulent beach shrub) + in old limbs also few of largest weevils.

11.9 Pale cracking(?) ad like beetles under logs near beach. (on sand). Beetles very active + fly a little way when disturbed. Often conceal themselves in moss, under logs + in climbs etc. Elaterids under stones etc. Water beetles in small spring 1 ½ mi up ~~track~~.

10. Just common to mile up road under dead leaves etc + in shade) Hippomane found under shady grove of such (bluish powdered).

11. Under stones logs leaves etc.

12. Green + shiny beetles (Bupr(Buprestidae?)) under logs etc on long sand beach also crawled on log. Beetle larva buried a few inches in the sand under a log. Scavenger beetles common + active under dead turtles.

13 Big larva + next in size = (1) in Hippomane twig Buprestidae? + green beetle see (12). Small beetles larvae + pupae infesting mangrove pods + sometimes young live roots. A great proportion of pods infested but some grow nevertheless. Often pods - (seed  ) fall on shore - at high tide beetles are killed. (Beetle flat black beetles from unknown locality of the

5 8

S A. 13 Galap. ego, possibly same Id '25

" 14 Dermestid same as above, pale beetles also under turtles & burying themselves when uncovered, big scarabs (hist) also same locality & usually in depressions or slightly buried.

15 Staph. on Ship board. pale beetles in same locality as above. little beetles & hard Cerambycids on Hippomane (Poison tree), Cerambycids lie closely appressed to twig & cling tenaciously when tackled, found in a small grove 200 yds from shore & on the dead trees, stumps, & mimic ~~twig~~ bark fairly well = .

16. 1½ miles below Villamil, = W. water beetles rather scarce in mangrove etc swamp at high tide level behind a beach of sand & stones. Other beetles under stones etc. Mangrove see 15.

Iguana Cove Alb. Mar 17 – 21

S.W. pt of Id. Scarcely any flat land. Huge green cut rising 5000 ft. right from sea. Much rain now, vegetation of dry & green zones mixed. very abundant. too much so for good collecting. Selicy Ergates (cactus borer) in spider web

5A

19 Elaterid dead Spondylid (Tragosoma? ?) under small fern. Scarabid in fertile soil under stone at cove, other beetles under stones & loose earth, humus etc. – all below 100 ft elev.

59.

S.A.

with Banks B. & [illegible]

## Tagus Cove. Mar 22 – Apr 20

Mt 4000 ft high, not very good for Coleoptera. Rather green zone (small) at top & a few hundred ft below some flower beetles & Coccinellid etc.

20 Buprestid in small cañon at head of cove. They frequent slender leafed cotton & rest on their trunks (stems). Active, about 6 observed. They run on opposite side of trunk & run up a bit as you approach, reminding one of Attidae among spiders. When you go too near they drop to the ground & fly away. Taken on a hot morning. Fungus beetles on fungus on a tree limb rare.

21. Rhynchophora often in copula, common on shrubs, high & low altitudes. Coccinellid on summit (4000 ft) on a leaf, only one seen. Elaterids under leaves mould etc on ground 1500 ft, other beetles under loose leaves etc. Flower beetles 3500–4000 ft mostly on composite flowers. Staphs 1500 ft under leaves etc.

22. Carabids under leaves etc. [illegible]

23. Calosomas rather plentiful sea level & 1500 ft at least.

## Banks Bay Apr 10–16 – 06.

A rough pebbly beach. A couple of miles of dry zone to base of Mt which is about 4700 or 5000 ft & quite green. Went up

Albemarle Isl

Banks Bay. Apr-10-17

2300 ft elev. saw but little in this green zone which commenced at about 2000 ft. Remains of Mallodon borings in Scalesia (tree-fern). In dryer zone [illegible] [illegible] ? ([illegible] plant) Cerambycid bores also in Cassia.

S.A. [illegible]. A little insect (Scarabaeid - Tenebrionid) common common running at night about the coarse rough sand above high water line. Found in the evening. They run a ways & then stop for a moment & then resume their perambulations. Fast Cerambycid-like beetle. found also running about.

Apr 10 - flying about sand beach, very common & attracted by our big camp fire.

Apr 12 In the evening I walked along the coarse sand beach interrupted at the water's edge & elsewhere by pebbles. It grew dark & I carried a lantern. Tenebrionids of Apr-10 were taken & (it was low tide) about the low water mark where the sand was damp I saw across a very swift tiger beetle which I caught. A little further along I put down my light & about a dozen more cicindelids were attracted by the light, nor would they leave it until all were taken. Several

61. Albemarle Id.
Banks Bay Apr 10-17.

were seen in copula, they would fly from a foot or two to the light & climb up the wires etc. In 2 or 3 places on this small beach I ran across other smaller groups of tiger beetles & I got about 25 all told. They appear therefore to go about in small parties & are nocturnal.

| 3 miles inland at mt base green Calosoma fairly plentiful & 1 Elaterid? taken about my blankets in the early morning. Tiny blk. carrion beetles on person at sunset. Went up mt 2500 ft. where it is green like on James. Green Calosoma l'pin seen at 2000 ft.

| Little chrysomelids common feeding at croton blossoms, some in copula. Near shore little grey flea beetle like Tagus Cove sp. cam. at 3000 ft (Tagus), seen on Croton

SA. 24 Larva in loose soil?, in inland, chrysomelids on Croton (notes) Cerambycid like beetles at Opuntia (cactus) flowers (only place where this was observed) mounted blk beetle on person (notes).

SA 25 On beach see notes. (Scarabaeus?)

26. Phyncophora near shore, on croton, fairly common cerambycid at beach. Elaterid 3 miles in (notes) ground beetles 3 m inland. Cerambycid larva in Cassia 3 m in (notes)

SA 62

# Albemarle.

27 Narborough. North shore. Apr-18-19.
Inner less fertile strip here dry brush.
Only boring one seen, under some dead leaves
over a [illegible] soil a barren place. Remains of
Mallodon in small sp. of Scalesia common to
low altitude. Green Calosoma clythia seen

28 Banks B. Calosoma pretty plentiful in
green spots. (Notes).

Old Cobos Settlement
= Bull Beef Anchorage. Apr 24-'27
= 9-10 m W of Villamil

(found this with, perhaps an [illegible] here)

~~28~~ Old Mallodon borings in Avicennia tree (a
large shore tree.)

28 Pieces of fungi infested by beetles only 2
pieces of this fungi seen + growing on exposed
Hippomane tree (in shade) a few hundred
ft from beach; see no 29 for beetles.

29 Curved larva boring in Hibiscus slim branches,
few seen. Long white larva under old
manure, thick one with strong thoracic legs
under bark of poison tree (Hippomane)
Otiorhyncus (?) on shrub, elater under stone
Single brown beetle under bark of old
Avicennia tree on beach + under a colony of ants
(red + about 1/2 same length), possibly disturbed
from place isolated from ants. Staphs in
der old manure (cattle) under Hippomane

63
SA

# Albemarle Co.
## Bull Beef

29 tree not common, little slender more or less blackish beetle on fungi (# 28), tiny convex pale brown beetle under bark of Quercus in middle of huge colony (ants) extending several feet around trunk under bark & in old crannies & holes. 1 little ant in little with pale abdomen beetles common in old sawdust & encircled by ant nest. Beetles single or in small groups & undisturbed by ants.

30 Very shiny short-elytra beetles (little) under rather old manure & in it in a few cases, biggest scarabs under manure & in ground on rock ± under manure. Larvae of same & still deeper. Several larvae - adults under old entrails of bull killed (in March) - 1½ month ago. Larvae apparently about mature intestines full of grass & correspond therefore to manure beef. Multitude of scarabs very common under rather old manure & in a few cases in recent manure. also a little ways in earth under manure. Tenebrionids under stones & old manure & a couple of the large Elk ones on crotch of old upright branch of Hippomane in debris.

31. Tenebrionids under stones leaves old manure etc.

64
5A.

# Albemarle I'd.
## Bull Beef.

31 Dermestes larvae about hide + bones of bull (dead. 75 days), very few imagos, remains of staphs seen (probably the larger sp.), blue beetles very active but don't fly much, common about bones, under hide etc.

32. Chrysomelids on shrubs, flea beetles (mordellids) found on Cryptocarpus pyriformis flowers (which were rather old). Tenebrios under old manure, two long antennaed beetles, one with single antenna on between a fungus (Polyporaceae), other on Croton leaf.

Villamil, April 30 May 3-06.

Getting ~~rather~~ late for coleoptera evidence of lateness - many dead specimens of Mallodon etc ~~in~~ under Hippomane bark + in holes in wood

33 Cerambycids, some dead, under the bark of Hippomane + some at the base of these trees, trees dead + well perforated, 2 humped backed beetles (Ptinidae?) in Cassia picta holes (exit) spec. shrubs well perforated, ground beetles all about, sea level.

65
SA

# Albemarle Id
## Cowley Mt.

A big rather gradual crater Mt Aug 9-13
East Albemarle. 06.

Exceedingly barren on the lower levels + up to at least 250 ft. Lower levels pure pumice stone. sparse opuntia + brush. At 250 ft. a little more brush + dry tufts of grass - dry season. 1200 ft tells. got a good deal more grassy + a few vines etc. Bursera (Palo Santo). Scalesia (stunted kind) near + down to shore + above 1200 ft. bigger Scalesia. 2000 ft = green zone (the air is apparently blocked by the bulk of Indefat before reaching Cowley), more vines brush etc. 1800 ft lichens all over trees. Put away 2 pieces of Scalesia save - 1800 ft. 1st contains Mallodon which follow scalesia to shore (where it is scarce) 2nd. hump back beetles (mature + larvae probably).

34 2 Scarabids from Charles Id larvae 1760 ft. hatched early in Aug. ~~Spondylid~~ (Trogositid.) low alt. James Id. James B.

35. Cowley Id. (Islet off the Mt). under stones etc. many dead ones. J. R. Slevin

36. Minute ~~curved beetle~~ on person. Green zone (2150 ft. (trogositid) J R Slevin 2100 ft Rhyncophora feed on cactus. found low

66

SA.

# Albemarle.

## Cowley Mt.

36. Alt living in old [illegible] else on cactus. 200 ft ±

37 Tenebrionids 1400 ft. not common, under stones. Rhyncophora on Opuntia

38 Beetle James B (James Id), on person, low alt.

## Villamil Mt + sea level. Aug 20 - Sept 5. 06.

Apparently several months too early (San Tomas 1300 ft) for Cerambycidae (nearly mature larvae of Mallodon in Scalesia + big new tree). (upper levels). Minute beetles under bark etc. common as imagos. Calosoma (Carabids) common under stones manure etc (in pastures

The Above Paragraph refers to upper levels. ie from 1000 to summit. Foggy in morning to shore - mostly drizzled all day at 1300 ft where the hacienda was. Very verdant up here Summit 3700 = pasture land. grass ferns + arboreal heliotrope crater = dry zone. = Croton cactus etc.

Low levels. pale fast long antennae beetle of beach (taken under logs. on previous occasions) common now at light. 1/5 mile from beach in pools water beetles are common

Got nothing at light.

67
SA.

Albemarle.
Villamil + San Tomas

Aug Sept

39 Green Calosoma common a little ways above hacienda (1300 ft), especially under old cattle manure, some in copula + a few partially dead. [(Note that on Chatham + Chs this beetle appears (low lands) in Feb + Mar) here however it is high alt. ~~land~~ + green]. When object is overturned beetle remains quiet, Tros. (Scarabaeids) from contents of ancient cow intestines = manure. beetles usually under but also in manure. — Green carrion beetle now on shipboard + dermestes pretty well cleaned out. green beetle in hold. but uncommon. Saw one or 2 about dead matter

—41 Cerambycid larvae common on one tree = fallen big new tree. 1000 ft. boring usually under bark. Little beetles under bark of big dead new tree. Little cylindrical reddish beetles (1 species) boring in bark + wood, presence detected by much dust. common. Tenebrionids 600 ft. under stones etc.

Get tree's name

+2 Cerambycid (E.S. King) at light, sea level. Ptinidae, 2 big specimens in stems of low alt. Scalesia, much dust below indicates presence. rest of beetles all under bark of new tree 1200 ft

68
SA.

Albemarle.

Villamil + San Tomas

43. A few fungus beetles ~~in~~ shelf fungus 1100 ft. on fence rail, 2 little carabids in evening running about on dry mud soil in field on shore, water beetles see notes I. about elytra little beetle under damp log 1300 ft.

44 Staphs 1200 ft. about dead cattle (often killed) carabid larvae 1200 ft. under stones; reddish carabid 1200 ft in shallow cave under stones 2 ptinidae?, larger in Composite (Scalesia) 1400 ft. other (1400 ft) larvae under log near tree bank.

45. Water beetles common (see notes), minute specims. common, crawling about green algae pools shallow, about sea level & affected by tide.

46 Scarabeid larvae in old extrad manure (~~cattle~~) 1200 ft. (see #39) Large-jawed Carabid 1400–1000 ft under damp logs etc not common, others common 1200 ft under stones

red elaterid in branches 39-46- under log 1200 ft.

Errors =

Ergates is used for Elvira.

Castella lusoh not Castella
but Zanthoxylum pterota.
Acacia = Pithecolobium dulce
[illegible] Tournefortia sp.
Compositae = Scalesia var.
Those [illegible] = wrongly called scaled

Notes on Duncan, Jervis
Abingdon Bindloe Newman
+ Culpepper + Tower

Duncan Id. Dec-1-17-05.

Worked mostly in Crater on tortoise (camped.) Anchored on N± side of Isle which is quite rugged + steep 1280 ft altitude climbed in a couple of hrs. Isle covered with Brush interspersed with opuntia. Zanthoxylum Piscidia Acacia (prosopis dulces?) Brush covered with lichens especially higher. No green good here though small ferns + moss + composite on acute summit. Rather early at least ~~for lepidoptera~~ for most things. #3 beetles hiding in bunches of 10 or 2 under fern roots + soil on rocky summit, rather swift. #4 - pupae rather common, only in dead croton, produces silvery ergates. Remains of metallic buprestid in croton brush near shore, must be common later as nos were found dead in galleries took some of the twigs to SF but nothing emerged (Jan 31-05)

Often foggy at summit

Dun I At Camp in crater (800 ft.), elater at fruits rhyncophora under dead croton bark.

2 ~~2~~ Beetles under stones.

3 Beetles very common on summit under moss, fern rts, etc

4 Pupae in base of croton brush 1 to brush larva in croton, Cerambycid + buprestid dead in croton such bush on many reason

70

Duncan. Aug (15-14) -06.

Numbers repeated :. distinguish letters & in

Dun. Id. a good deal drayer than Dec-05

Collected up to about 900 ft. but mostly about shore. Croton infested with beetles

Buprestid elytra found in tree pockets (lizard). which eat many grass hoppers

No living buprestids seen though several dead ones extracted from old borings in croton which here appears rather unhealthy dead & dying plants numerous. Scale insects here on them.

Near shore collected several croton stems that I took to be infested with Buprestids Cleridae cerambycidae & smaller beetles

Duncan Id. full of lichens at all altitudes especially growing on Cordia lutea. Examined lichens & found a few beetles therein (-Bruchidae in pods of Prosopis?)

Few beetles under stones at low alt.

1 Minute beetles in Croton, minutest cylindrical ones under old croton bark. a few seen

Buprestid, dead in croton, 2 elaters hiding in lichens, slenderer larva boring in old croton & apparently in old holes, other darker one in Prosopis dulcis feeding on pulp

Lepidoptera?.

Dun | Duncan contd. Aug 14-15. '06

2. Ptinidae in prosopsis twigs 200 ft. larvae of same. 2 Rhyncophora. in old hole in ~~croton~~, seen from exterior. other larvae. 2 - [illegible]. + 2 cleridae common in croton. little red ptinid (?) dead in prosopis twig.

3 Tenebrionids under stones, low alt. rare. Bruchidae: in lichens searched up to 300 ft. & found them esp. near coast.

Reared some of these bruchids from prosopis ~~[illegible]~~ pods. also turned the latter early in October 2 sp? smaller ones in opuli. Oct 17. about done emerging

72.

Jervis Dec-18.21. 05.

A very small tall barren Isl.
with a salt lagoon near shore.
Lost bottle of beetles overboard.
It contained Stenoaro + smaller
deeply sculptured tenebrionid.
Both pretty plentiful.

Jan 1 Apparently a ~~little~~ early for this species,
a few larvae + pupae + imagos in dead croton
branches ~~bases~~ (bush standing) they are not found
at base of bush as in the following.

" 2 Taken by splitting down croton stems where
fine sawdust on ground directly beneath
existed. Rather early for these also. Larvae
+ pupae more plentiful than adult,
+ almost always found at base of main
stem, + even at beginning of roots. Holes
showed exit of adults. Usually 1 larva
to bush. Fairly common.

Tower Id.   Sept. 14-16

Small low Id. with steep shores, no soil much ugly brush.

Little shiny Rhyncophora on person. Unfortunately the bottle containing my day's collecting was broken & several minute new beetles were lost.

A little staph very common in damp rotting cactus (Opuntia) leaves. cactus somewhat decumbent; staph small rather thick & brownish on old cactus leaf. 3 exceedingly minute convex shining blk beetles taken. Under bursera bark much punctured 2 pale brown swift elaterid beetles found = Beetles ~~thy~~ flat & with thin elytra. 2 little short-elytra beetles under bark.

Tow. 1 Ground beetles mostly under cactus leaves & debris, rare.

2 Cerambycid larva in bursera, prob. croton ergates.

2 4 Big beetles & 4 short elytra blk ones in rotting cactus, big beetles rare & rights in putrid mass smaller ones common & in filth also, little reddish beetles under bursera bark & long numerous holes therein brown ones common under bark, also pupae of same.

Remains of cactus rhyncophora & green Calosomas.

Bindloe. Sept 16-18 '06.

Small island & desolate, dried patches of vegetation bordered or surrounded by recent black lava. lava predominating. Rowed down coast 2 miles to where soil went down to waters edge. tufa formation Day warm & oppressive. Insects very scarce cactus small & decumbent.

Tenebrionids very scarce, under old bursera logs etc. elateridae common under bursera bark chips (on tree.) & often in bunches, counted 10 touching each other. Cerambycid larva found in stem base of Euphorbia. Rhyncophora larva in decaying cactus

Notice the climate is warmer on these northern Ids than in the main group.

B1 I

Remains of green Calosoma.

Abingdon Sept 18 23-06

Small but high Id. (1960 ft.) & quite green on weather side where we anchored. The Mt. reminds one of Indefatigable on a small scale. Nice walking on lower levels Much cactus

Zones pretty good here.

A rather open country with much cactus & a good green zone on upper region

# Abingdon

Plenty of fresh blk larva in places.
Very damp on upper areas at this time
Moderate green zone at about 700 ft.
above this the Arboreal Heliotrope (Tournefortia, sp). + composites. Ferns higher.
May call extreme summit brown zone
consists of very thick beds of ferns breast
high + the spiny Zanthoxylum pterota.
covered with brown lichens. Nothing about
this dense summit almost exclusively of ferns.
lower down viny plants. very damp.
2 little blk staphs. 1700 ft. under bark +
rotten wood

Ab1 Little carabid just below fern belt. + under
some old tree bark., another spcm seen but
too swift 1700 ft. = very dank + damp + green
zone. larva 1700 ft. in rotten Zanthoxylum
limb

2. ~~Spider~~. - Elaterid rather rare, hiding
under stones (in cacti?). All other beetles + larvae
infesting putrefying cactus (Opuntia) not
so common as on Tower, staph same as last
Tower Id. spcm, low dry zone 100 ft.

3 Commonest beetles under stones around roots
of cactus etc., penetrate well into green zone
a few of the larger tenebrionids seen on
leaves. (as also on Chs Id.)

76
abi

Abingdon Isl.

3 commonest perhaps at about 500 ft. = below green zone

4. ~~Longicorn~~: long antennae beetles swift + as usual nocturnal (except on cactus flowers at Bank's Bay A.M.) at light on beach, common

2 sp. of Ptinidae: common in Prosopsis twigs lots of dust at borings. Adults just emerging, low alt. Geospizas (pallida) peck out these + the cactus boring moth larvae).

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Wenman Islet. Sept. 24 - '06.
collected 3-4 hrs on a flat place on N side. Islet steep + rocky

5. mostly at light on sand beach, very common larvae, scooped out of sand.

6. Rhyncophora on beach under big piece of timber (driftwood) 2 species in seperate bunches. holes in timber, size of beetles, is this a new immigrant?

Wenman, Sept 24 - 06
Collected 3-4 hrs. on flat space on N Side 200 ft alt.
Islet. precipitous + fairly high; brush.
See if Panama counter current strikes these Ids. current + temperature warmer here.
~~Wenman~~ What looked like a new pale brown [illegible] was taken by Slevin on person. Got lost in big Ken bottle, insect minute. # Bottled material with data.

Culpepper, a few hours = 3 hrs Sept 25-06
Very steep + uninviting place.
Collected on small talus. Dermestid larval [illegible] seen. Beetles not uncommon under stones. 1 bottle of stuff.
Green Calosoma remains.
It seems as though 1 small sp. of tenebrio- is peculiar to Wenman + Culpepper

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End of Voyage.

Galapagos Expedition
Coleopterological
notes only